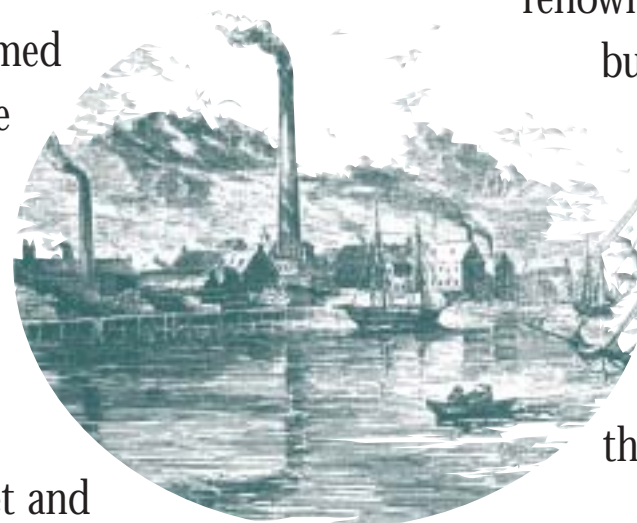


Historical Context

The history of Eastern Cambridge sets the context for the analysis of current conditions, and serves as a point of reference for understanding community concerns and proposals for the future.

The development history of Eastern Cambridge begins with local businessman and developer Andrew Craigie, who in 1795 bought up the few farms, marshlands, and grazing fields that made up the area. In partnership with Boston businessman Harrison Gray Otis, Craigie formed the Lechmere Point Corporation and built the Canal Bridge across the Charles River in 1809, adjacent to the site of the present Museum of Science. At the time, the Point was virtually an island with only a narrow connection to the mainland. The first two streets through the area were Cambridge Street and Bridge Street (now Monsignor O'Brien Highway).



Courtesy: Cambridge Historical Commission

Analysis

In 1811, the Corporation laid out a street grid aligned with Cambridge Street that covered the peninsula and extended into the surrounding marshlands of the Charles River. The Corporation successfully petitioned for the development of a new county courthouse in East Cambridge, donating the land and \$24,000 for the building's construction. They retained renowned Boston architect Charles Bulfinch to design the building, which still stands today on Cambridge Street.

In 1813, the Lechmere Point Corporation sold its first parcels for industrial purposes along Miller's River (north of Cambridge Street) to the Boston Porcelain & Glass Company.

This ushered in an era of intensive industrialization in Eastern Cambridge. The area’s industrial history is evident today in the historic structures that remain in the area, some of which have successfully been renovated for residential and office use.

As the demand for factory sites close to water transportation intensified, land reclamation became a more attractive option.



The upper map shows the first streets platted by the Lechmere Point Corporation in the early 1800s. Canals linked to the Charles, noted on the lower map, helped attract industry to Eastern Cambridge in the middle of the 19th century.
Courtesy: Cambridge Historical Commission

A variety of industries such as woodworking, foundries, oilcloth manufacturers, ink producers, publishing companies, and meat packing were attracted to East Cambridge because of its proximity to Boston, large tracts of newly created land, cheap immigrant labor, and excellent transportation links.

A large number of the older houses in the area also demonstrate the typical pattern for worker housing from the early nineteenth century. These early houses were mostly small, single-family worker’s cottages. The physical development of the neighborhood closely reflected the prevailing social hierarchy, with workers’ housing located closest to the factories and the larger and more prestigious homes built in the center of the present East Cambridge neighborhood, away from both the noxious factories and the marshlands. Managers took up residence along Otis and Thorndike Streets (named after the early shareholders in the Lechmere Point Corporation) with the sites nearest the courthouse holding the highest prestige. A wide variety of these historic housing types contribute to the human scale and rich architectural character of the neighborhood.

While early developers paid little attention to industrial impacts on nearby neighborhoods, public activism in the late 1800s spurred several important changes in public health and open space. Environmental conditions were the most immediate concern, as seen in the public outcry against the smell and disease emanating from polluted local waterways. This resulted in the creation of a system of sewer lines and the infilling of most of the canal system. The most offensive waterway of all, the Millers River, was mostly filled in when the Boston & Albany Railroad purchased the adjoining land to build a vast expanse of rail yards.

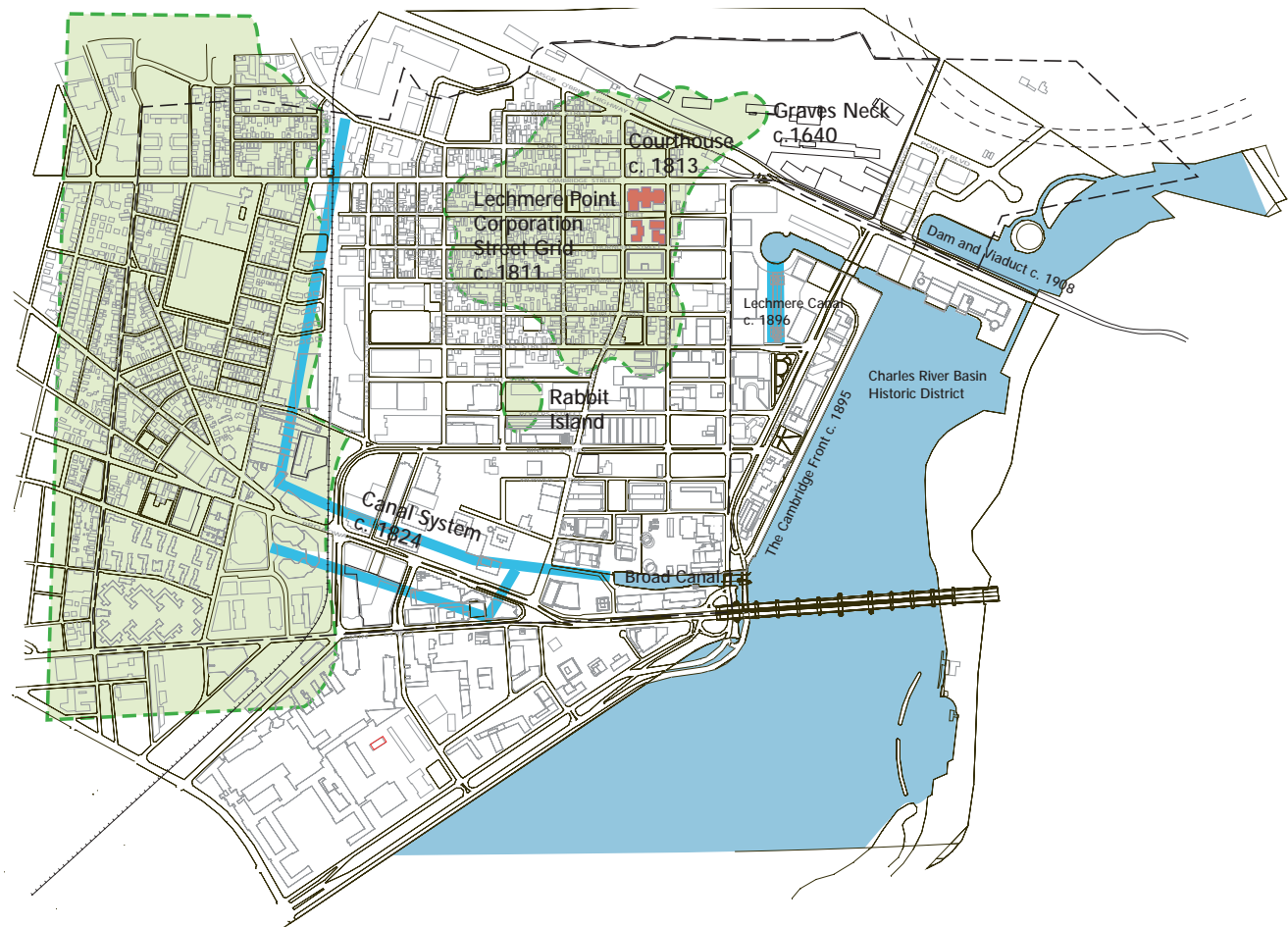


A 1925 view, looking south toward the Charles and Boston, shows the heavy concentration of industrial buildings around Kendall Square and the residential areas to the east. The Irving & Casson-A.H. Davenport complex (below) still stands at the corner of First and Cambridge.
Courtesy: Cambridge Historical Commission

In the late 1800s, the Charles River began to be viewed as an important amenity. In 1892, city planners commissioned Frederick Law Olmsted, the designer of New York’s Central Park and Boston’s Emerald Necklace, to design “The Cambridge Front,” a new waterfront park and beach along the Charles River. Unfortunately, the Charles River waterfront was deemed too valuable as industrial land and too polluted for such use. Although it was never built, the plan encapsulated an early desire to give residents a link to the river and open space—a planning goal that survives to this day. One of the first, and most dramatic, results of the shifting perception of the Charles River was the relocation of the Massachusetts Institute of Technology (MIT) from the Back Bay to its present site along the river in 1916.



Courtesy: Cambridge Historical Commission



Historic Patterns in Eastern Cambridge

Like many urban communities across the country, Eastern Cambridge experienced a major decline in manufacturing between 1950 and 1980. The rise of arterial roadways and truck transportation encouraged industrial development on cheaper land close to the burgeoning interstate highway system. Many of East Cambridge's

industrial buildings, and even its cherished courthouse, sat vacant and in danger of demolition after the Second World War.

The evolution from manufacturing center to high-density office district helped create a social and physical divide between the residential neighborhoods and the commercial areas of Eastern Cambridge.

The advent of urban renewal in the 1960s and 1970s dramatically altered the scale and pattern of development in Eastern Cambridge. While the residential neighborhoods remained relatively intact, many of the factories and warehouses around Kendall Square were razed to the ground to make way for new office development, in hopes of spurring new economic growth. In the



Worthington Place (top) is a prominent industrial-to-residential conversion in the area. The CambridgeSide Galleria was part of the City's redevelopment along the Lechmere Canal. (lower photo)

late 1960s, approximately 14 acres in the heart of Kendall Square was designated an Urban Renewal Area. The decline in land values opened the area for light industrial uses, including parking lots, distribution centers and auto repair shops. Over the course of more than twenty years, Kendall Square was gradually rebuilt with a mix of commercial office, hotel, and retail uses, including a major research center for the U.S. Department of Transportation.

In the 1980s, a research-based economic boom began to accelerate the pace of development in Eastern Cambridge. Fueled in part by proximity to

MIT, the area experienced a dramatic increase in construction of office and research buildings. After a brief interruption during the recession of the early 1990s, office and research development was further stimulated by a boom in biotechnology, software development, and a host of supporting services drawn to MIT and Kendall Square. Many of the historic buildings that had been preserved became magnets for new technology-oriented businesses. In addition, some 800 units of housing were built in the Graves Landing, Esplanade, and River Court projects, all on sites formerly used for industry. Furthermore, the Worthington Place redevelopment

and a mix of new development and redevelopment along Fulkerson Street are also successful examples of a conversion from industrial to residential uses in the past decade. In total, about a million square feet of residential use has been constructed on sites formerly in industrial use. Despite this recent residential development, there is still a strong demand for additional housing in the area.

The rapid development of office and research uses in the area has brought an increase in the daily population of workers. Approximately 10,000 people worked in the area in 1990, almost equivalent to the residential population. The redevelopment of Kendall Square as a national center for technology and research has brought significant economic benefits to the city. At the same time, this development has created impacts on surrounding residential neighborhoods, including a significant growth in traffic. Recent concerns over the future of Eastern Cambridge center on the increasingly rapid pace of development, increased housing prices, and the impacts of this development on quality of life for nearby residents.

Recent Planning Initiatives

Eastern Cambridge has been the subject of several major planning and zoning initiatives over the past two decades. A major planning and urban design effort in the late 1970s led to the East Cambridge Riverfront Plan, which involved rezoning the area from First Street to the Charles River as a mixed-use district. With a strong economy in the 1980s, the City was able to manage a public/private venture that resulted in some \$50 million in public money for creating new parks, public parking, and roadway work, leveraging approximately \$800 million in private funds for housing, office, research & development, and retail uses. This area is nearly complete, with only the CambridgeSide hotel remaining to be completed.

In adjoining Kendall Square, the Cambridge Redevelopment Authority established an urban renewal plan in the 1950s. By the 1960s, there was the expectation that National Aeronautics and Space Administration (NASA) would establish its center in Kendall Square. However, in 1969 NASA closed operations in Cambridge and the NASA complex was occupied by the Transportation Systems Center of the Department of Transportation in 1970. The redevelopment plan for the Kendall Square area shifted to office, research & development and hotel uses. At present, biotech uses are increasing their presence in the area, with Biogen expanding and Amgen having located in the One Kendall Square development. As the new Riverfront and Kendall Square developments began to emerge, the neighborhood and the City attempted to revise the zoning for the areas between the two projects and the residential district. A committee led by the City, with representatives of the neighborhood and businesses, met for over a year (1990-1991) and proposed zoning recommendations, which were not ultimately adopted by the City Council. However, draft guidelines were produced by the City, and were used to help review development planned at the 10-acre Commonwealth Energy site east of Third St. These guidelines and the Riverfront planning and design documents were also useful in the review of the numerous proposals reviewed under the city's Interim Planning Overlay Permit (IPOP) project review requirements.

Over the past few decades, the city and community have responded to increasing development pressures with a series of creative planning initiatives. The ECaPS planning process builds on the successful work done to date in growth management, transportation planning and open space enhancements citywide. Specific initiatives within the study area over the past fifteen years include the East Cambridge Development Review Process and Guidelines (1985), East Cambridge Neighborhood Plan (1989), and the North Point Policy Plan and Design Guidelines (1989).

Citywide planning efforts have included the Cambridge Growth Policy Document (1993), the Report of the Green Ribbon Open Space Committee (2000), and the Cambridge Pedestrian Plan (2000). In 1988, the Cambridge Affordable Housing Trust established a fee of \$3.28 per square foot for non-residential development to boost the city's affordable housing supply. In addition, the City's zoning was amended to create an inclusionary ordinance that requires 15 percent of new units in large developments to be affordable.

The City has also developed a series of transportation initiatives, such as the 1992 Vehicle Trip Reduction Ordinance, to reduce new traffic growth and improve access for public transit, pedestrians and cyclists, and the 1998 Parking and Transportation Demand Management Ordinance, which requires commercial developers to facilitate ridesharing, subsidize transit, contribute to employee shuttles, and otherwise encourage non-automobile travel for their employees. In combination, these initiatives have contributed to maintaining and improving quality of life in Eastern Cambridge, and provide a foundation for many of the recommendations in this report.

CITYWIDE REZONING, 2001

In 1997, the Citywide Growth Management Advisory Committee (CGMAC) was formed in response to growing community concerns over the quality and density of new development, traffic growth, and housing affordability. The CGMAC committee included broad representation from Cambridge neighborhoods, businesses, and institutions, as well as City staff. This three-year planning effort culminated in a Citywide Rezoning Petition, submitted by the Planning Board to the City Council in September 2000. The Petition was approved by the City Council in February 2001 after a five-month public review process.

As part of the Citywide Rezoning Petition, seventeen commercial districts were rezoned to residential, while housing became an allowed use everywhere in the city. To reduce new traffic growth, non-residential densities were significantly lowered in many areas, and parking ratios were adjusted. Eastern Cambridge was excluded from some of these changes in anticipation of the ECaPS zoning recommendations contained in this report pending the recommendations of this study.

However, some aspects of the Citywide rezoning adopted in February 2001 apply to the entire city, including the Eastern Cambridge Study Area. These include amendment of the city's density requirements to include above-ground structured parking in the calculations of Floor Area Ratio (FAR) and the citywide project review process. Project review was extended to all new development over 50,000 square feet or in excess of an established traffic threshold.

THE LARKIN PETITION: JANUARY 2000

In spite of the progress made by CGMAC, the rapid pace of development in Eastern Cambridge prompted neighborhood residents to seek immediate action. In September 1999, Cambridge citizens submitted the Larkin Petition requesting the City Council to impose an 18-month moratorium on all new commercial development over 20,000 square feet and new residential development over 20 units within a defined portion of Eastern Cambridge. The primary concerns expressed in the petition were the encroachment of commercial development into residential neighborhoods, increasing traffic congestion, real estate price escalation, and inadequate public open space. The City Council approved the moratorium from January 2000 to July 2001, and the City Manager established the Eastern Cambridge Planning Study Committee to consider appropriate zoning measures and other policies for the moratorium area.

Urban Design and Open Space

I. URBAN DESIGN

The character of Eastern Cambridge is best captured by the word *diversity*. From the intimately scaled residential blocks of East Cambridge to the commercial office towers of Kendall Square, the area reflects a range of development patterns from the 1830s to today. The historic context presented in Chapter Two briefly outlines the forces that shaped the individual form, character, and quality of the neighborhoods and industrial areas. The following overview will describe in greater detail the existing urban design and open space characteristics of sub-districts within the larger Study Area. These sub-districts include: the East Cambridge, Wellington/ Harrington, and

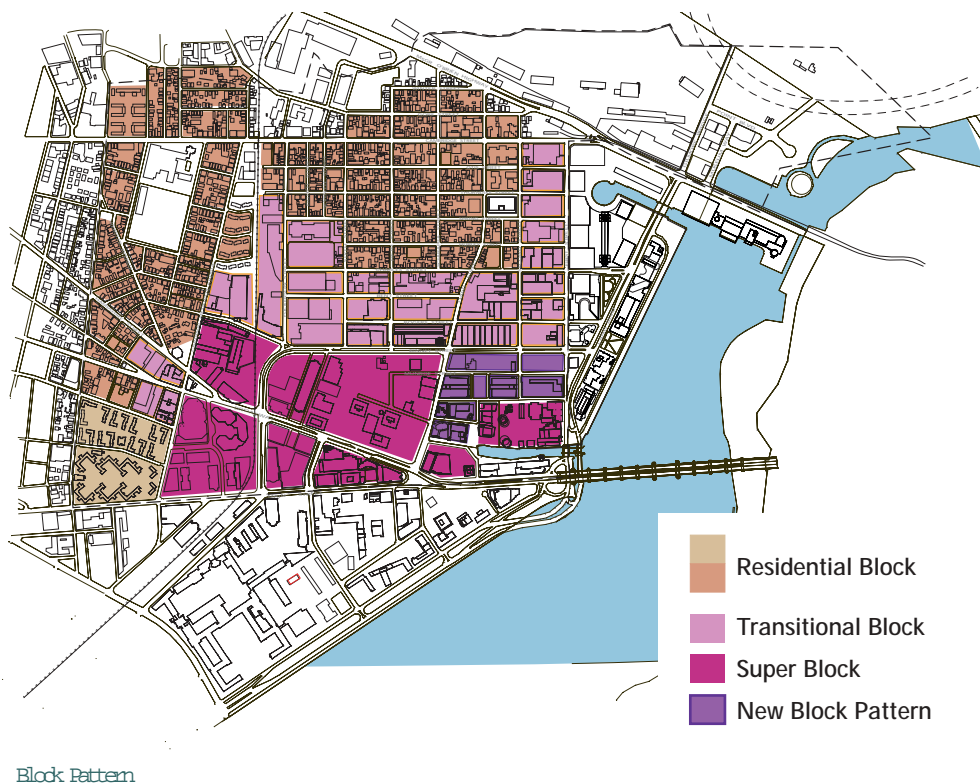
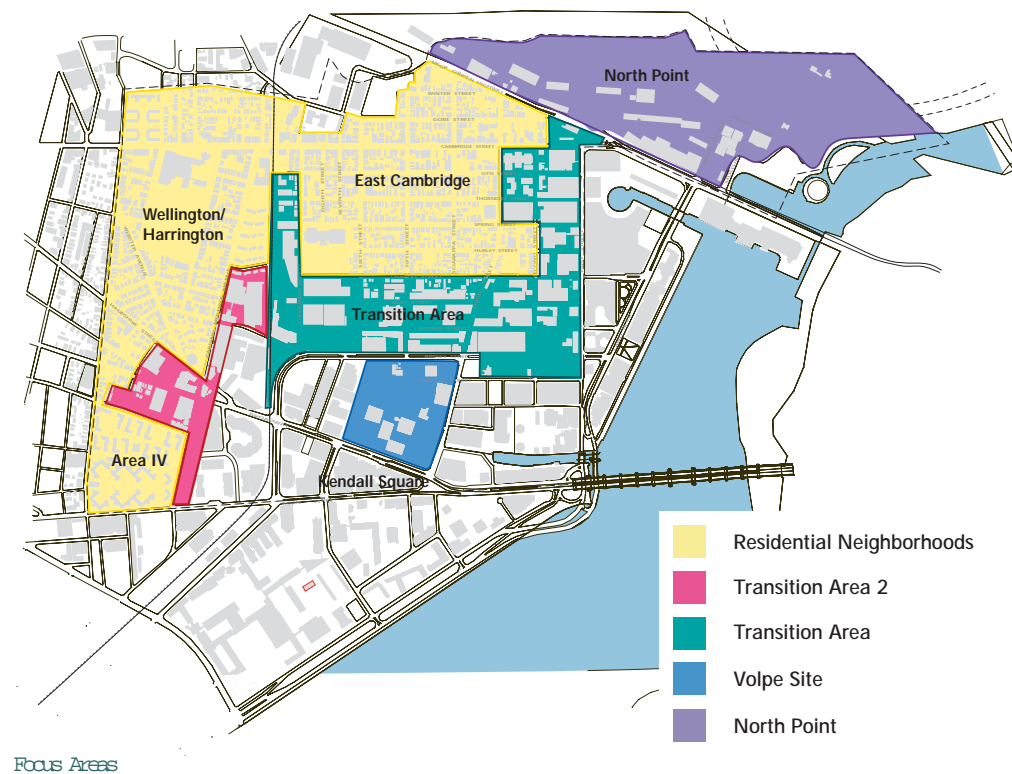
Area IV residential neighborhoods; the Transition Areas between the neighborhoods and commercial districts; Kendall Square; and North Point.

EAST CAMBRIDGE

The East Cambridge neighborhood, one of the oldest residential areas in this part of the city, is bounded by the Cambridge/Somerville line to the north, the Charles River to the east, Broadway to the south, and the rail right-of-way to the west. The block pattern reflects the historic grid laid out in the early 1800s, with classically scaled blocks that are approximately 200 feet wide by 400 feet long. The size of these blocks creates a walkable, pedestrian-scale environment. In particular, the size of the blocks affords pedestrians choices of route within a short distance, and the orientation of the blocks creates long south-facing (and north-facing) frontages. The historic Bulfinch Courthouse and adjacent civic buildings are important landmarks anchoring the eastern edge of the neighborhood. The Middlesex County Courthouse, a modern tower located south of the Bulfinch complex, is out of scale with the surrounding context of smaller residential buildings. The Kennedy School and Ahern Field, as well as the skating rink and Gold Star Mothers Park, demonstrate the positive interactions of civic uses adjacent to open space. The commercial spine of Cambridge Street, lined with shops and restaurants, is the primary east-west connector and in many ways the “main street” of the community.

WELLINGTON/ HARRINGTON

The Wellington-Harrington neighborhood is bounded by the Cambridge/Somerville line to the north, the railroad tracks to the east, and Hampshire Street to the south and west. In contrast to the regular street pattern found in East Cambridge, Wellington/Harrington includes a mix of rectangular, square, and triangular blocks of varying sizes. The scale and character of development change dramatically as one moves east towards Kendall Square, with small wood-frame houses giving way to



the refurbished brick factory buildings and new offices east of Cardinal Medeiros Avenue. The shops, restaurants and offices at One Kendall, with their interconnected pedestrian spaces and street-level windows, create a vibrant center of activity that draws both residents and visitors. Further north, Cambridge Street forms a continuous retail corridor connecting Wellington/ Harrington with East Cambridge and Inman Square. The Harrington School, Donnelly Field and Frisoli Youth Center create an important place for community activity.

AREA IV

The Area IV neighborhood is bounded by Hampshire Street to the north, the railroad tracks to the east, Massachusetts Avenue to the south, and Prospect Street to the west. North of Harvard Street, Area IV includes traditional one-and two-family houses in close proximity to large-scale office buildings. The large block of office development between Broadway and Main Street limits the number of east-west connections from the neighborhood to Kendall Square. South of Harvard Street are Newtowne Court and Washington Elms, refurbished public housing developments made up of garden-style apartments on two consolidated city blocks. Main Street, running through the lower portion of the neighborhood, serves as the primary connector to both Kendall Square and Central Square. The green space and recreational facilities at Harvard Street Park create a cluster of activity that is reinforced by a row of small shops at the intersection of Broadway and Market Street.

TRANSITION AREAS

The Transition Areas include a broad swath of commercial and industrial development separating the residential neighborhoods from Kendall Square and the Lechmere Canal. Historically, these areas approximately mark the shoreline that was filled to create new land for industrial development in the 1800s. This is an area of transitions, both of use as well as scale. The current proximity of residential and industrial uses raises issues of noise from mechanical equipment, visual and noise impacts

of loading docks, peak-hour traffic headed to and from offices, in addition to the greater bulk of commercial and industrial buildings adjacent to the fine grained triple-decker residential fabric.

For purposes of this study, the blocks that form a U-shape around East Cambridge are referred to as Transition Area A, while the blocks extending south along the eastern edge of Wellington/ Harrington and Area IV are referred to as Transition Area B. The block pattern in Transition Area A is an extension of the East Cambridge grid, though the individual lots are much larger. In contrast, Transition Area B is made up of large blocks with few connecting through streets. The size and scale of buildings in the Transition Areas vary widely, from one-story industrial sheds to massive telecommunications towers. Several historic buildings, including American Twine and Worthington Place, have been preserved and still retain their unique industrial character.

KENDALL SQUARE

Kendall Square is the office/R&D core of Eastern Cambridge, centered on the transit station, Marriott Hotel, and the shops and restaurants along Main Street. The majority of development in Kendall Square dates from the 1970s and 1980s, when vacant factories and warehouses were torn down and replaced with new office buildings. The brick building and clock tower on Main Street, one of the few remaining industrial structures, is a reminder of the massive industrial infrastructure that once existed. Today, Kendall Square may be characterized as composed of large blocks, wide roadways, and large buildings surrounded by green space and parking. The Volpe Center illustrates this urban form, with a series of self-contained buildings, parking lots, and lawns that bear little relationship to their context. The 20-acre site, equivalent in size to eight East Cambridge residential blocks, acts as a barrier to pedestrian movement between the neighborhoods and Kendall Square. In contrast, Main Street offers many of the elements of

a thriving commercial district, including a transit station, pedestrian plaza, and a variety of shops, cafes, and restaurants. The internal food court at Kendall Square draws a significant amount of activity away from the street, however, making the area feel less lively. In addition, the street-fronting retail lacks critical mass, and has only limited continuity along both sides of the street.

NORTH POINT

North Point is a triangular area approximately sixty acres in size, bounded by the Somerville and Boston City lines to the north, the Charles River Basin to the east, and Monsignor O’Brien Highway to the south and west. The site is isolated by high-speed roadways, rail yards, and water, with only one north-south connection at the Gilmore Bridge. At the same time, the sheer amount of land, its proximity to transit and future open space, and excellent views of Boston make it a likely site for development. North Point comprises two distinct areas on either side of the Gilmore Bridge: to the west, rail yards and warehouses predominate, and the area is used for shipping and truck operations. Immediately east of the Gilmore Bridge are Museum Towers (a 435-unit residential development) and the E.F. office building. An MWRA pumping facility is also located east of the bridge, with additional land owned by the state with uses still to be determined. North Point Park, currently under development as part of the New Charles River Basin master plan, will occupy the eastern edge of the site along the water. Additional parkland, the North Point Wilds, is also planned for the area.

Based on the analysis of existing urban design conditions in Eastern Cambridge, several key themes and opportunities emerge for future planning:

- The historic block pattern of East Cambridge creates a walkable, pedestrian-scale environment, and is a useful model for large development sites.
- The creation of pleasant and accessible neighborhoods is closely tied to the continuity of pedestrian connections, emphasizing the importance of connecting to existing street grids and pathways.

- More gradual changes in scale and massing in the Transition Area can help to improve the connections between residential neighborhoods and Kendall Square.
- Well-designed civic buildings such as the Bulfinch Courthouse on Cambridge Street play a key role in the image and identity of existing neighborhoods, and should be established in new development areas, where possible.
- The location of open space adjacent to other community facilities creates a strong interaction of uses that supports community life.
- Well-defined street walls, human-scale buildings, and windows at street level are essential to creating an attractive pedestrian environment.
- A critical mass of street-level retail is important in creating lively commercial districts serving adjacent development, and should be encouraged where appropriate.

OPEN SPACE

The first public open spaces in Eastern Cambridge were created in the residential neighborhoods and along the riverfront. The Charles River is also an important open space resource for adjacent neighborhoods and the larger community. North Point Park will provide a major new public open space, and enhance accessibility to the water’s edge. The current open space inventory for Eastern Cambridge includes*:

- Tot lots and playgrounds: Hurley Playground, Kennedy School/Ahern Field, Costa Lopez/Taylor Park, Gannett Warren Pals Park, Gold Star Mothers Park, Harrington School/ Donnelly Field, Harvard Street Playground, Market Street Playground, Charles Park and Silva Park.

- Neighborhood / Community Parks: Gold Star Mothers Park, Harrington School/ Donnelly Field, and Kennedy School/ Ahern Field.

The existing residential neighborhoods offer very few potential sites for new public open space. As a result, major new parks and recreational facilities will likely need to be located outside the existing neighborhoods. Strong pedestrian and bicycle connections will be essential to link these parks with existing residential areas.



Open Space Analysis

North Point and the Volpe Center offer the most viable opportunities for creating significant new open space in Eastern Cambridge. It will be essential to consider broad community open space needs when planning for these areas. The March 2000 Report of the Green Ribbon Open Space Committee identified the following additional needs for public open space in Eastern Cambridge:

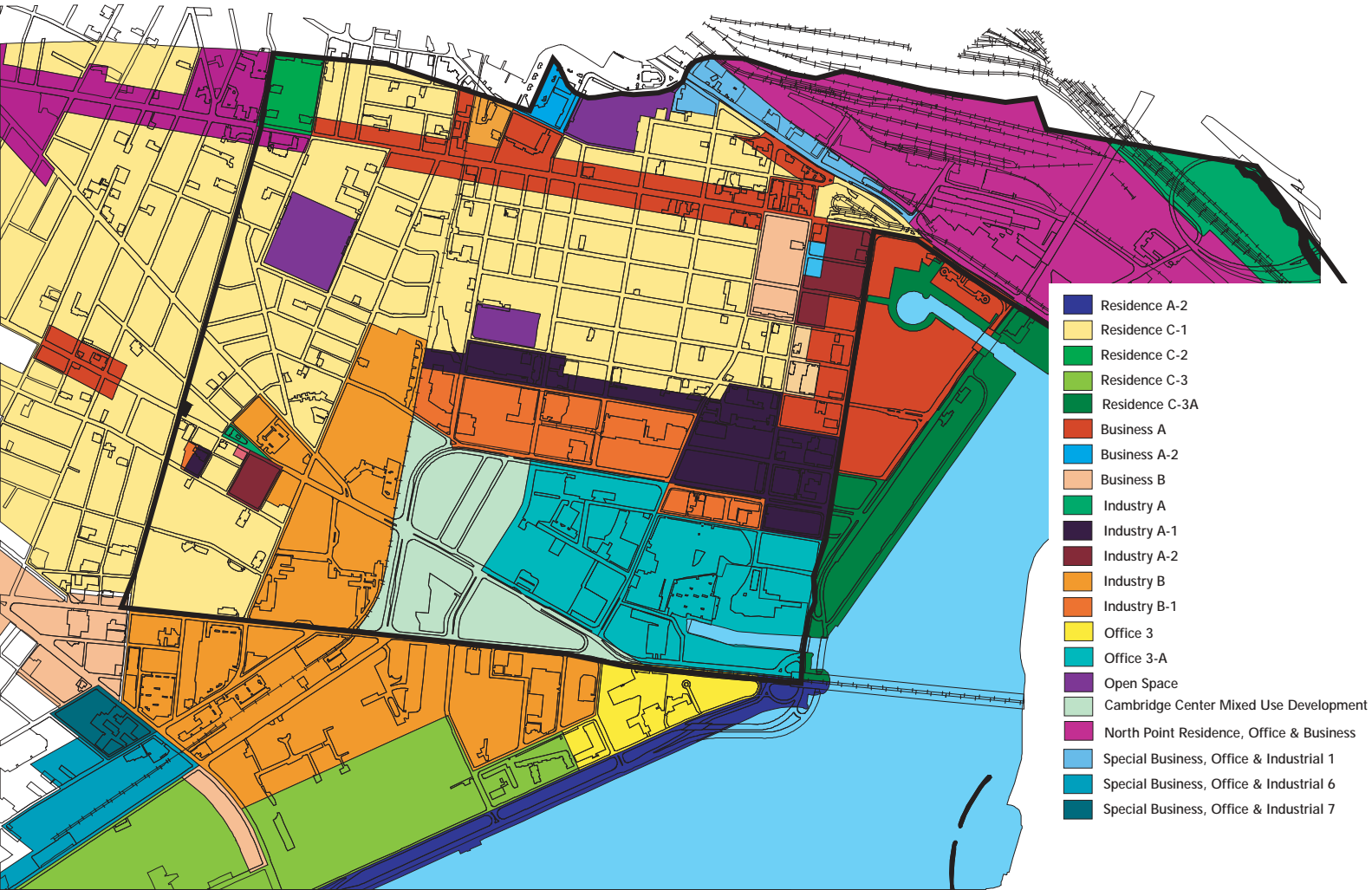
- A neighborhood and community park for Area 4
- A multi-use path along the Grand Junction railway right of way
- Three to four multipurpose fields
- A bike and pedestrian path connection between North Point and the Linear Park through Davis Square
- A tot lot for North Point
- A neighborhood or community park for East Cambridge or North Point

Land Use and Zoning

Historically, Eastern Cambridge has been characterized by tightly-knit residential neighborhoods surrounded by industrial uses. In the last half of the 20th century, a decline in industry produced large parcels of vacant and underused property south of Binney Street. Land clearance for urban renewal after World War II created vast areas of open land around Kendall Square,

EXISTING AND PERMITTED DEVELOPMENT IN EASTERN CAMBRIDGE

LAND USE TYPE	TOTAL GFA (SQ. FT.)	% OF STUDY AREA TOTAL
Office and R&D	7,868,201	40.1%
Residential	4,803,755	24.5%
Industrial	2,304,151	11.8%
Mixed Use	2,261,439	11.5%
Parking	1,307,185	6.7%
Other	730,402	3.7%
Retail, Service & Entertainment	301,936	1.5%
Institutional	26,345	0.1%



in anticipation of future development. Over the past thirty years, Eastern Cambridge has emerged as a nationally prominent center for high-tech business and research, leading to the conversion of numerous industrial sites into office and R&D uses. This has produced a land use pattern of moderate-density residential neighborhoods surrounded by high-density commercial and residential development.

The Eastern Cambridge project area includes 21 different zoning districts, the significant majority of which are commercial or industrial zones. However, the Residence C-1

district is the largest single zone within the study area, and includes most of the old residential neighborhoods in East Cambridge, Wellington/ Harrington, and Area IV. The numerous zoning districts mirror the diversity of land uses within the project area. Residential densities in the Residence C-1 district are fairly uniform, with a Floor Area Ratio (FAR) of approximately 0.7 that reflects the traditional housing stock of one and two-family homes. Office/ R&D densities typically range between FAR 1.0 and 3.0, with the highest densities at Kendall Square approaching FAR 6.0.

Eight major development projects are currently underway in Eastern Cambridge. These projects were permitted prior to the passage of the moratorium in January 2000. In total, these projects comprise 3.2 million square feet of new development and 3,300 additional parking spaces. Approximately three quarters of this new development is office and/or research and development space, one tenth is housing, while the remainder is made up of telecommunications facilities, retail, and hotel space. These projects will significantly shift the overall land use mix in Eastern Cambridge, increasing the proportion of office/R&D uses from 33 percent to 40 percent of total gross floor area (GFA) in the Study Area.

CURRENT DEVELOPMENT PROJECTS IN EASTERN CAMBRIDGE

PROJECT	DEVELOPMENT AREA (SQ. FT)	USE (SQ. FT.)	PARKING SPACES
210 Broadway	70,000	70,000 office	70
Tech Square	599,000	599,000 office	622
Biogen	210,000	210,000 office/R&D	0
Amgen	285,000	285,000 office/R&D	0
286 Third Street	128,000	126,000 office 2,000 retail	1,667
300 Bent Street	61,000	61,000 office	100
Thypin Steel: • 170 Fulkerson	135,000	113,000 telecom 22,000 office	N/A
• 157 Sixth	365,000	185,000 telecom 180,000 R&D	N/A
Cambridge Research Park	1,370,000	200 residential units 300 hotel rooms 76,000 retail 850,000 office	2,238
TOTAL	3,223,000	2,403,000 office/R&D 298,000 telecom 78,000 retail 200 residential units 300 hotel rooms	4,697

FUTURE DEVELOPMENT POTENTIAL

In order to better understand the potential for future development in Eastern Cambridge, it is useful to compare projected growth under existing zoning and Citywide Rezoning proposals for Eastern Cambridge. In both scenarios, the existing residential neighborhoods and core commercial areas are unlikely to experience significant new growth in the foreseeable future. The analysis is therefore focused on three areas where major new development is likely to occur: North Point, the Volpe Center, and the Transition Areas between existing neighborhoods and Kendall Square. Under existing zoning regulations, in place during the moratorium, approximately nine million square feet of new residential and commercial development is projected to be built in Eastern Cambridge over the next twenty years. This represents an increase of 45 percent over existing and permitted GFA. New development at North Point alone represents approximately 50 percent of this predicted growth, while the Volpe Center accounts for an additional 30 percent.

20-YEAR BUILD-OUT COMPARISON*

	EXISTING ZONING			CITYWIDE REZONING			PS PROPOSAL		
	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL	COMMERCIAL	RESIDENTIAL	TOTAL
North Point	851,000sf (19%)	3,574,000sf (81%)	4,425,000sf	851,000sf (19%)	3,574,000sf (81%)	4,425,000sf	992,000sf (27%)	2,695,000sf (74%)	3,687,000sf
Volpe Center	1,127,000sf (62%)	1,804,000sf (38%)	2,931,000sf	564,000sf (19%)	2,367,000sf (81%)	2,931,000sf	675,000sf (26%)	1,873,000sf (74%)	2,548,000sf
Transition Areas	1,283,000sf (85%)	226,000sf (15%)	1,509,000sf	385,000sf (85%)	68,000sf (15%)	453,000sf	113,000sf (11%)	950,000sf (89%)	1,063,000sf
Total	3,261,000sf (37%)	5,604,000sf (63%)	8,865,000sf	1,800,000sf (23%)	6,009,000sf (77%)	7,809,000sf	1,781,000sf (24%)	5,518,000sf (76%)	7,299,000sf

* Based on a market analysis conducted for the Eastern Cambridge Planning Study, 20-year growth potential represents build out of 55% of total growth potential at North Point, 90% of total growth potential at the Volpe Center, and 62% of total growth potential in the Transition Areas.

Under the Citywide Rezoning Petition, approximately eight million square feet of new development was projected to occur in Eastern Cambridge over twenty years. More significant, however, was the shift from commercial to residential use. The proposed Citywide Rezoning would have reduced new commercial development by thirty percent compared to existing zoning, and would have increased residential development by nearly ten percent.

The ECaPS zoning proposal remains consistent with goals of the Citywide proposal to provide strong incentives for residential development and reduce commercial FARs to address peak hour traffic impacts. Under the ECaPS proposal, over seven million square feet of development is expected in the study area over a twenty year period, with over three-quarters being housing and a quarter as office and R&D development. The charts on this page and the following represent projected new development in twenty years for North Point, the Volpe Center Area, and the Transition Areas under existing zoning and under the zoning recommendations of this study and the amount of housing anticipated under these zoning recommendations. See Appendix B for additional details.

20-YEAR HOUSING PROJECTIONS UNDER ECAPS PROPOSAL

AREA	NUMBER OF HOUSING UNITS
North Point	2,160
Volpe Center	1,500
Transition Areas	760
TOTAL	4,420

* Calculation based on an average unit size of 1,250 sq. ft. per unit

* Based on a market analysis conducted for the Eastern Cambridge Planning Study, 20-year growth potential represents build out of 55% of total growth potential at North Point, 90% of total growth potential at the Volpe Center, and 62% of total growth potential in the Transition Areas.

OPPORTUNITIES

Opportunities in Eastern Cambridge that should guide future planning efforts are as follows:

- North Point and the Volpe Center area provide an opportunity for the development of significant amount of residential and new neighborhoods in areas previously dominated by industrial and commercial uses.
- Affordability of housing for a variety of income groups has become an issue in Eastern Cambridge, as in the rest of the City. Development of large amounts of housing offers the opportunity to create a significant amount of affordable housing, as required by the City’s inclusionary ordinance.
- Commercial development, particularly retail, will be required to support the new residential development and to create vibrant and lively mixed-use neighborhoods. Areas close to the Lechmere T-station in North Point and along Third Street in the Volpe Center offer particularly attractive areas for development of neighborhood-serving retail.
- The areas of new development and redevelopment of existing areas offer opportunities for creation of appropriate transitions in height and uses between the low-scale residential neighborhoods and the higher scale development in Kendall Square and along the riverfront. The Transition Areas, particularly, offer the potential for creation of more residential uses over time, close to the existing neighborhoods.

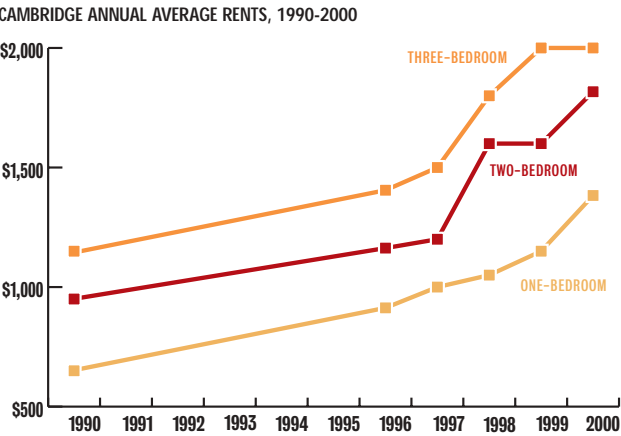
Real Estate Market

HOUSING

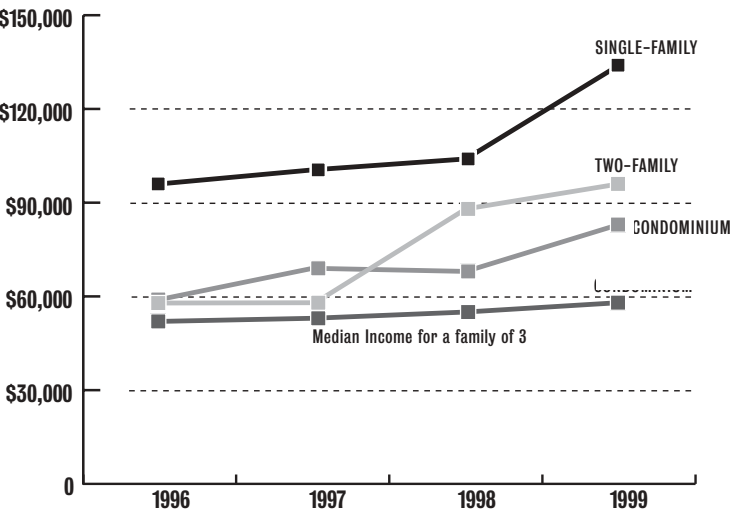
RENTAL HOUSING MARKET CONDITIONS

Construction of new rental housing in Cambridge was slow from 1975 through 1995, while rent control was in effect. In the 1980s and early 1990s, most new construction consisted of high-end condominiums. The limited supply of rental housing has created a long-term supply and demand imbalance, with demand greatly exceeding supply. The problem is particularly acute in the moderate and low-income tiers of the rental apartment market.

The 1990 Census found that 70 percent of Cambridge’s occupied housing units were renter-occupied. Between 1996 and year-end 1999, 1,325 units were added to the Cambridge housing supply; the vast majority of these (over 80 percent) were rental apartment units. Despite this construction activity, the rental vacancy rate fell from 1.3 percent in 1997 to 0.9 percent in 2000, while median rents continued to rise. The chronic undersupply of rental housing has caused rental rates to increase significantly; between 1996 and 1999, Cambridge rents increased at a compounded annual rate of 6 percent. During the past year, rental rates have risen by 10 to 20 percent. Rental price increases are expected to continue at a slower rate through 2003.



CAMBRIDGE MEDIAN INCOME AND MINIMUM INCOME REQUIRED TO PURCHASE A HOME, 1996-1999



FOR-SALE HOUSING MARKET CONDITIONS

The for-sale housing market is also characterized by high demand and limited additions to supply. This demand is fueled by a series of factors that will continue to put pressure on local markets for the foreseeable future, including:

- Rising prices elsewhere in the metro region
- The presence of a wide range of well-paid employment opportunities
- The attraction of Cambridge as a desirable urban community for those who seek an alternative to the suburbs

On the supply side, the greatest impediments to both market-rate and affordable housing production are the limited availability of sites and the high cost of land and construction. These conditions have led to low vacancy rates (less than 1 percent) and rapidly escalating prices similar to conditions found in several of Boston’s near-downtown neighborhoods. Cambridge sale prices have increased dramatically in nearly every housing type and every neighborhood over the past five years.

Given the price of Cambridge land and the lack of availability at any price, condominium development has been the predominant for-sale housing type for new construction over the past thirty years. As a result of recent pricing pressure in

PERCENT CHANGE IN CAMBRIDGE MEDIAN HOUSE PRICES: 1994-1999

CHANGE IN MEDIAN PURCHASE PRICE 1994-1999	SINGLE- FAMILY	TWO- FAMILY	THREE- FAMILY	ALL 1- TO 3- FAMILY	CONDOS
East Cambridge	45%	59%	148%	54%	-1%
Wellington/Harrington	64%	50%	87%	60%	83%
Area 4	100%	65%	120%	109%	50%
Citywide	39%	75%	89%	70%	49%

the for-sale housing market, some types of housing (notably luxury condominiums) in some locations (prime sites near public transportation, educational institutions and other amenities) can compete with office and R&D for land. Expanding the supply of new housing is not likely to reduce price pressures significantly, since the high cost of construction will continue to dictate that new housing is developed at or near the top of the market.

Between 1995 and 2000, housing prices in Eastern Cambridge increased faster than in the rest of the city. In contrast, the area remains among the city's most affordable areas for one to three family homes. Housing affordability in Eastern Cambridge is expected to become a greater challenge over the next several years as median home prices move further beyond the reach of median-income households.

Eastern Cambridge experienced a sharp increase in demand for a wide variety of housing types over the past five years, from single-family to high-rise condominiums. In combination with the high cost and scarcity of land, this has produced a vacancy rate of less than one percent and a dramatic surge in rental rates and median house prices. At the same time, median incomes have not kept pace with rising housing costs, putting more housing out of reach for middle and low-income households. As a consequence of price increases, high-end condominiums in prime locations have become competitive with office and R&D uses for land.

The City's Inclusionary Zoning ordinance requires developers of any new or converted residential development with ten or more units to provide 15% of the total number of units as

affordable housing. It is, therefore, expected that the ECaPS zoning proposals, which strongly encourage residential development throughout the study area, will result in the development of significant new affordable housing in the area.

OFFICE AND R&D

REGIONAL COMMERCIAL MARKET OVERVIEW

The demand for commercial property is a function of employment growth, which under most conditions rises and falls directly with overall economic growth. The City of Boston is the twentieth largest city in the nation, and the seventh largest Consolidated Metropolitan Statistical Area (CMSA). The unemployment rate in the Boston CMSA has been consistently below national averages since 1993. The Cambridge unemployment rate has been below the national average since 1990, dropping to 1.9 percent in 1998 and 1.3 percent in May 2000.

Eastern Cambridge has approximately as many jobs as it has residents. Like the rest of the City and Boston, it provides employment and income for an area that extends well beyond its borders. Projections of employment by industry sector provide an indicator of expected demand for various types of commercial property over the next five years. Service employment in Massachusetts is projected to grow 1.8 percent annually, twice the growth rate of overall employment. Business services, engineering and consulting will lead this sector, with a 3.3 percent growth rate projected through 2004 by the New England Economic Project (May 2000).

The Massachusetts economy as a whole is expected to grow more slowly over the next several years than it did during the 1990s, principally due to a shortage of skilled labor. This shortage is due in part to the accelerated inflation of housing prices. Price inflation is a major risk to the Massachusetts economy, as the accompanying wage inflation is likely to increase the number of firms that will seek less expensive locations.

The regional economy also faces risk from the demand side. The Boston region's specialization in money management, financial services and business investment supply industries makes it particularly vulnerable to either stock market losses or rising interest rates. This risk factor comes with associated costs of greater uncertainty that must be taken into account in both public policy and private sector decision-making.

In sum, the New England Economic Project's employment growth projections through 2003 indicate a continuation of demand for commercial space, albeit at lower levels than experienced in the 1990s.

CAMBRIDGE COMMERCIAL MARKET OVERVIEW

The Second Quarter 2000 Greater Boston office market conditions were very strong, with a direct vacancy rate of 1.7 percent in the Central Business District (CBD). The Cambridge market, which comprises roughly 16 percent of the Boston area non-Central Business District (CBD) office market, had a direct vacancy rate of 0.5 percent. With the decline in the Internet economy, the vacancy rate in Cambridge has increased to 17% in the second quarter 2001 as a number of businesses have downsized.

The Cambridge office market is divided into three sub-markets: Eastern Cambridge, Harvard Square and Alewife. The Eastern Cambridge market includes approximately 8.5 million square feet, representing more than 70 percent of the Cambridge market. The attractiveness of the Eastern Cambridge market stems in large measure from its proximity to MIT, which provides one of the most skilled workforces in the country, as well as access to downtown Boston and the Longwood Medical Area. In combination with constraints on supply, these factors contributed to driving office and R&D vacancy rates very low and establishing rental rates and land prices that were among the highest in the country.

The dramatic growth of the biotech industry over the past ten years has contributed to increasing market pressures for R&D space in Eastern Cambridge. Three leading biotechnology companies are currently located in Eastern Cambridge: Amgen Inc., Biogen Inc., and Genzyme Corporation. Together, these three companies produce five of the industry’s ten best-selling products, according to a 1999 Ernst and Young report. Developers are currently investing approximately a billion dollars to build more than three million square feet of new research labs in Cambridge, more than doubling the city’s supply of R&D space. Most of this space will be built near Kendall Square, where five new research buildings totaling 1.2 million square feet are under construction or were recently completed. Additionally, as of July 2001, four other projects totaling 2.1 million square feet received approvals in the immediate neighborhood. Even with this new construction, the upward pricing pressure, particularly in the biotech sector is expected to continue.

By the middle of 2000, the Cambridge commercial office/R&D market consisted of 11,907,646 square feet of floor space. From the end of 1999 to the Second Quarter of 2000 the average office rental rate had increased from \$40.50 to \$50.56 per square foot – an increase of nearly 25 percent in six months. Price increases in 1999-2000 precipitated a striking difference between businesses and research facilities that could afford to locate in Eastern Cambridge before 1997 and those that can afford it today. Inexpensive office/R&D locations once offered by warehouse conversions have been filled up, and new start-up companies often have to look for space outside Eastern Cambridge. While this trend has changed subsequently with the slowing of the Internet economy, the biotech sector remains strong and in the long term this area is expected to continue to be attractive to the office and R&D sector.

RETAIL

RETAIL ACTIVITY IN EASTERN CAMBRIDGE

The ECaPS retail analysis surveyed existing retail in the study area and aimed to identify additional retail demand consistent with the study’s vision to create a vibrant, mixed-use community. Retail in Eastern Cambridge is predominantly clustered in four areas: the neighborhood shops, services and restaurants along Cambridge Street, which are characterized by low rents and sales volumes; the high-tech center of Kendall Square, characterized by high rents and sales volumes; the region-serving CambridgeSide Galleria mall and nearby shops on First Street; and the mixed-use retail, restaurant and entertainment center at One Kendall Square. In total, these areas comprise approximately 1 million square feet of retail space. A new mixed-use retail and entertainment center is currently under development at Cambridge Research Park, and will add 70,000 square feet of retail/ multifunctional theater space to the existing inventory. The distribution of retail by floor area in Eastern Cambridge is shown below.

EXISTING RETAIL

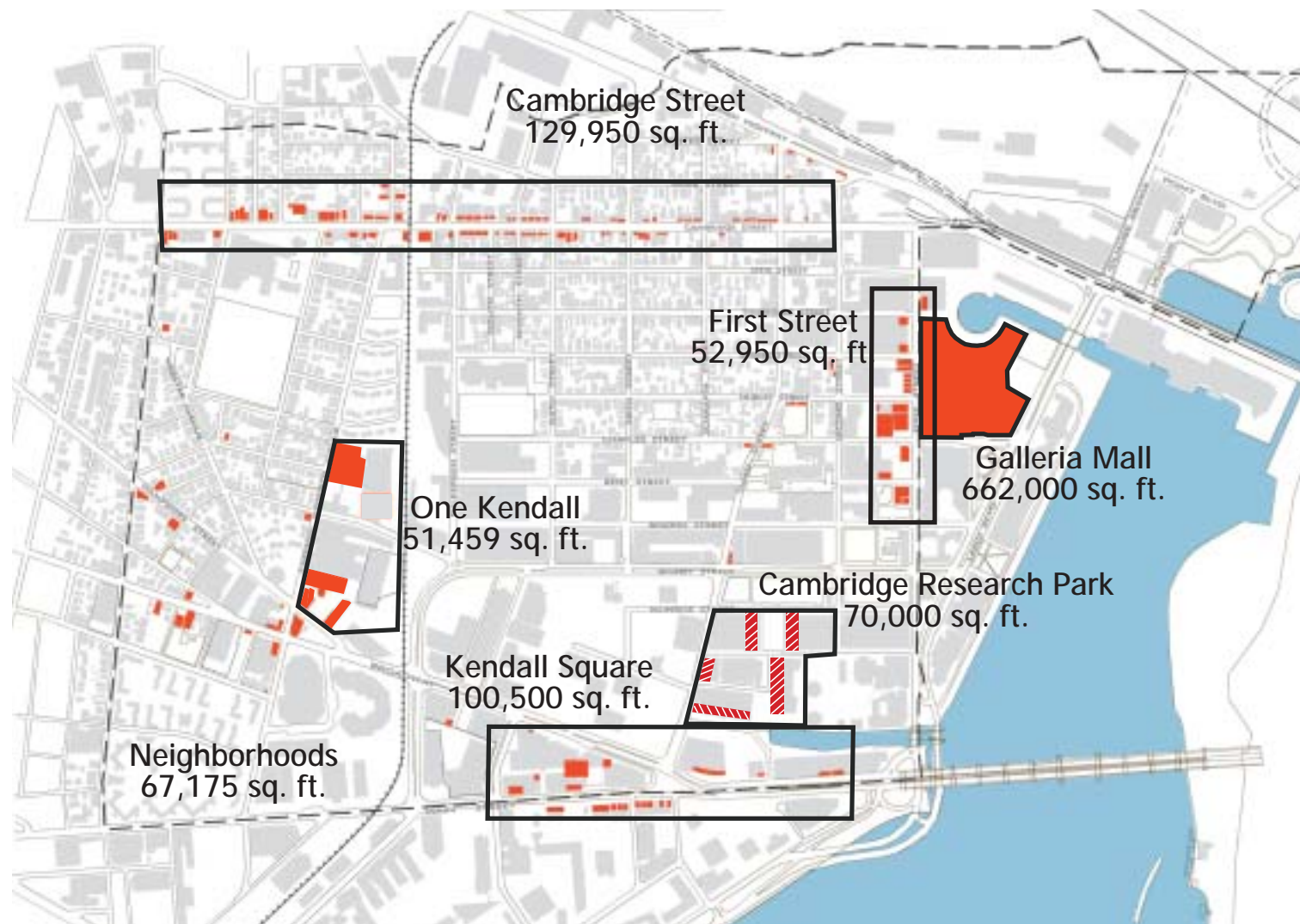
LOCATION	RETAIL FLOOR AREA (SQUARE FEET)
Cambridge Street	129,950
Neighborhoods	67,175
Kendall Square	100,500
First Street	52,950
One Kendall Square	51,450
Cambridge Research Park (permit granted)	70,000
Galleria	662,000
Total	1,134,025

Excluding the CambridgeSide Galleria mall, retail in Eastern Cambridge primarily consists of professional services, restaurants/cafes, and general retail. These are largely neighborhood-serving uses that draw customers from the local area. The distribution of retail by type of use is represented in the following table:

RETAIL IN EASTERN CAMBRIDGE		
TYPE OF RETAIL	AREA (SQ. FT.)*	AS PERCENT OF TOTAL
Professional Service	114,150	28%
Restaurant/Café	108,775	27%
General Retail	79,600	20%
Cinema	37,000	9%
Salon	28,000	7%
Auto-Related Use	21,025	5%
Bakery/Market	13,475	3%
Total	402,025	100%

* Excludes CambridgeSide Galleria and Cambridge Research Park
(Source: Byrne McKinney / Goody Clancy & Associates Analysis, Fall 2000)

Retail activity in Eastern Cambridge falls into three general categories, based on the source of demand: regional retail, employment center retail, and neighborhood retail. The CambridgeSide Galleria mall and national chain stores on First Street serve primarily a regional market. Smaller stores and eating establishments on First Street target neighborhood residents, employees, as well as people drawn to the mall. Retail establishments in Kendall Square cater primarily to employees in the immediate area. Kendall Square is essentially a nine-to-five, weekday market. Despite its large employment population, it has not yet achieved the critical mass necessary to support extensive street-level retail. Additional residential development in the area would help provide the clientele for seven-day retail. Cambridge Street and One Kendall Square serve a mix of local residents and employees, as well as visitors from elsewhere in the city. Finally, small shops scattered throughout the neighborhoods provide goods and services to local residents.



Location of existing and proposed retail

While existing retail serves a large number of the residents' needs, there are certain types of retail that are lacking. Additional convenience retail was identified as a need for the study area by the Committee as well as the public at the community workshops. Furthermore, future development at North Point and the Volpe Center area is likely to create additional need for this sector, which includes cafes, dry cleaners, small grocery stores, and similar neighborhood-serving retail. It is projected that the new North Point development

would be able to provide the critical mass of development to attract this new retail to the area, including to Cambridge Street. Initial development is likely to occur in North Point and serve the new neighborhood developed there. Over time, particularly with the moving of the Lechmere Station, this retail is likely to establish a stronger connection to Cambridge Street, strengthening the retail on Cambridge Street in the process.

While retail is allowed elsewhere in the study area, it is felt that North Point and the Volpe Center area would be the most likely locations for new retail to flourish due to significant additional residential and commercial development anticipated here. It is felt that new retail in the area should be in service of the neighborhood, and should not focus on drawing people from outside the neighborhood.

OPPORTUNITIES

Opportunities in Eastern Cambridge that should guide future planning efforts are as follows:

- The parity of land values for residential and commercial development in Eastern Cambridge offers an unusual opportunity to shift to residential use without sharply reducing land values, a prospect that would not have been viable five years ago.
- The continuing strength of the biotech sector suggests an opportunity for use of R&D office space within the Eastern Cambridge area by the biotech companies which are already located in the area.
- A significant increase in housing around Kendall Square, in combination with the proposed multifunctional theater complex at Cambridge Research Park, can be expected to increase the demand for restaurants and related entertainment that will extend the vitality of the area into the evening. With enough additional residential development, the area could gain a market for 18-hours-a-day, seven-days-a-week convenience retail, restaurants and services that benefit both the employee population and current residents.

Transportation

Regional roadway access to the Eastern Cambridge Planning Study area is provided by Monsignor O’Brien Highway and the Gilmore Bridge to I-93 in the north; Binney Street, Land Boulevard, and Memorial Drive to I-90 in the west; and the Longfellow Bridge and Monsignor O’Brien Highway to I-93 in the south. The map below shows the study area in its regional context. More local access is provided by Main Street, Broadway, Hampshire Street, and Cambridge Street.

Transit service is provided by the Red and Green Lines on the southern and northern edges of the study area respectively, also as shown in the map below. The area is also served by several MBTA bus routes. Privately operated shuttle buses serve some major employers, and ‘The Wave’, a bus provided by the Galleria and serving the public, shuttles between the Kendall T-station and the CambridgeSide Galleria mall.

The City’s transportation policies and projects are guided by the Vehicle Trip Reduction Ordinance (VTRO), a municipal

ordinance passed in 1992. The Parking and Transportation Demand Management (PTDM) ordinance requires programs to reduce single-occupancy vehicle travel for non-residential parking facilities. Both ordinances promote alternatives to single-occupant auto travel to reduce congestion and pollution and maintain the livability of Cambridge.

However, the prospect of considerable new development concentrated in specific parts of the study area – North Point, the Volpe Center site, and the Transition Areas – coupled with the trend towards increased car-ownership, has generated growing concern about cumulative impacts to the transportation system and growth of auto traffic within the neighborhoods. The degree to which non-auto mobility can be enhanced and vehicular access and off-street parking controlled play a significant role in determining the scale of these potential impacts.

TRAFFIC ANALYSIS

Similar to the transportation analysis done in connection with the Citywide Rezoning, two baseline conditions are considered in this study, existing conditions and permitted conditions. “Existing conditions” refers to 1998 (the year for which the most comprehensive and consistent set of transportation data is available), while “permitted conditions” refers to conditions that will prevail when projects for which building permits issued as of July 2001 are operational. It is important to address both of these conditions because there are almost 3.3 million square feet of development that have received permits and are likely to be occupied over the next few years. These developments have been subject to special permit transportation mitigation requirements that address conditions at

several locations in the study area. “Future conditions” includes existing conditions, development that is already under way, and ECaPS 20-year projections for development in the study area. Substantial data and analysis are available from other studies to facilitate the transportation analysis.

TRAFFIC VOLUMES AND CIRCULATION

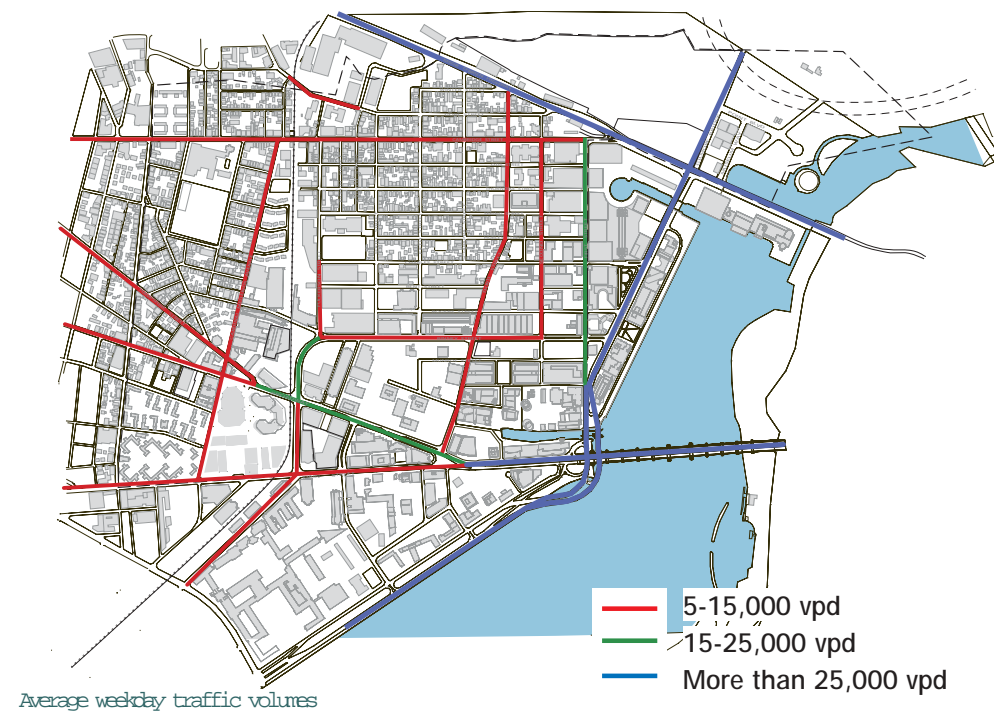
The geography, the configuration of arterial roadways, the presence of the Grand Junction railroad corridor through the heart of the study area, and the distribution of land uses in the study area result in a much higher level of vehicular traffic on corridors running in the north-south direction than in the east-west direction. The lack of continuous east-west connections across parts of the study area protects the neighborhood streets from traffic to some extent, forcing it to use the east-west arterials – Binney Street, Hampshire Street, Broadway and Main Street. The median on Binney Street west of Third Street deters some north-south traffic from percolating through East Cambridge, resulting in heavier volumes on Third Street, First Street, Land Boulevard, and Cardinal Medeiros Avenue.

According to the 1990 US Census, driving alone as a mode of travel to work for commuters living in the study area varied from 34.1% in the Kendall Square area to 45.9% in the North Point area. Also, according to the 1990 Census, the drive-alone share of commuters working in the study area varied from 63.8% near the Twin City Mall to 54% in the Kendall Square area. According to recent data, the drive-alone share of commuters working in the heart of Kendall Square has dropped to 43%*. 2000 US Census update of the Cambridge Journey to Work data is expected to be available in 2003.

**Survey of Kendall Square Urban Renewal Area as reported in Fay, Spofford and Thorndike’s Traffic Count Program and Trip Generation Analysis Annual Report, 2000.*



ECaPS study area in regional context



Average weekday traffic volumes (AWDT) are presented in the above plan. As can be seen, three streets at the periphery of the study area carry traffic exceeding 25,000 vehicles per day (vpd) and provide regional access: Land Boulevard/Memorial Drive, Monsignor O'Brien Highway, and Main Street/Broadway (as it crosses the Longfellow Bridge into Boston). Only five of the other streets in the study area (Broadway, Cambridge Street, Hampshire Street, Binney Street, Gore Street) carry more than 15,000 vpd. These provide connections to the other neighborhoods in Cambridge and Somerville. Most of the remaining streets in the area that connect to other neighborhoods carry less than 15,000 vpd.

The local streets carry less than 5,000 vpd. Third Street and the southern two-way section of Fulkerson Street are exceptions as they provide north-south connections between Kendall Square and Monsignor O'Brien Highway.

Neither First Street, the City's preferred route for traffic headed from Monsignor O'Brien Highway to the Kendall Square area, nor Second Street, connect directly to Monsignor O'Brien Highway. Third Street, on the other hand, does run directly from Monsignor O'Brien Highway to Broadway. As a result, there are significant turning volumes at the Monsignor O'Brien Highway / Third Street intersection. The dominant directions are the right turn to Third Street in the AM peak hours and the left turn to Monsignor O'Brien in the PM peak. Under year 2005 permitted conditions, the projected peak hour demand for each of these moves would exceed 900 vehicles.

Fulkerson Street is two-way between Charles Street and Binney Street. Currently, the intersection of Fulkerson, Little Binney, and Binney streets provides for all movements between these streets and westbound Binney Street. Observations show that a significant amount of traffic headed to Kendall Square cuts through the Twin City Mall and uses Fulkerson Street to head south. Hence, Fulkerson provides a connection between Monsignor O'Brien Highway and the One Kendall Square Garage on Little Binney as well as westbound Binney Street.

TRAFFIC OPERATIONS: LEVEL OF SERVICE AND CRITICAL MOVEMENTS

To understand the current performance of intersections in the study area, Level of Service (LOS) information was compiled for intersections in the study area (signalized and unsignalized), for which data are available (see Appendix G). This information was used to develop many of the recommendations in the neighborhood transportation plan (see Appendix F).



Intersections included in Critical Movements Analysis

In addition, Critical Movements analysis (explained in the next section, Future Traffic Operations) of 39 intersections was used to evaluate the impact of various development scenarios on future traffic performance. This analytical method does not provide the same level of detail as the LOS analysis but is a more appropriate tool for comparing long-term traffic impacts. The critical movements analysis is consistent with methodology used in connection with the Citywide Rezoning Petition.

The LOS analysis confirms capacity deficiencies causing motor vehicle delays at Land Boulevard/Msgr. O’Brien Highway, as well as at 6 other signalized locations. Deficiencies are also experienced at 4 un-signalized intersections.

FUTURE TRAFFIC OPERATIONS

While the methods used for analyzing traffic operations are the same as those used in connection with the Citywide Rezoning Petition, the Eastern Cambridge study provides a much more comprehensive analysis as it covers roughly the same number of intersections in a much smaller area. The analysis of future traffic operations includes the following four steps:

- Calculation of estimated cumulative traffic impacts of four development scenarios
- Critical sum analysis of 39 intersections
- Analysis of the impact of reduced parking ratios and a parking cap in North Point
- A neighborhood transportation plan proposing measures to improve future transportation operations, including vehicle circulation, transit accessibility, and pedestrian and bicycle mobility

Similar to the goal of the Citywide Rezoning Petition, the ECaPS goal is to reduce the anticipated number of trips generated by new development by 2020 to approximately half of what would have been allowed by existing zoning.

1. Traffic Impacts of Development Scenarios

Four development scenarios were compared. For each scenario the new floor area that would be expected in 20 years and the resulting AM/PM peak and daily auto trip generation were calculated. The scenarios include:

- Status Quo (existing zoning)
- Citywide Rezoning Petition
- Initial Land Use Scenario
- Initial Land Use Scenario with Auto Trip Reduction

While the Citywide Rezoning scenario accomplishes a reduction from the Status Quo (existing zoning), in Eastern Cambridge it falls short of the goal of a 50% reduction in anticipated growth in new trips generated by development. This is because a large amount of Cambridge’s development potential is within the ECaPS study area.

The Initial Land Use scenario is based on the Committee’s vision for Eastern Cambridge in terms of desired land use mixes and densities. The auto trip generation resulting from this scenario is lower than the Citywide scenario but again does not achieve a 50% reduction in new trips.

The Auto Trip Reduction scenario, the preferred scenario, uses the land use mix and densities of the Initial Land Use scenario coupled with a reduction in parking ratios. A 20% reduction in parking ratios is proposed, which is estimated to lower the auto mode share by 10 percentage points and overall auto trip generation by 20% . In addition, to ensure that trip generation remains low and does not exceed the parking supply, project proponents would be required to implement significant demand management programs – above and beyond what is currently required under the City’s Parking and Transportation Demand Management (PTDM) ordinance – and/or improve transit accessibility to a given area. This scenario meets the study goal of reducing the growth in new peak hour trips by 50%.

The peak hour traffic impact from new development for the four scenarios is as follows:

NEW PM PEAK HOUR AUTO TRIPS	
SCENARIO	NEW PM PEAK HOUR AUTO TRIPS
Staus Quo (existing zoning)	4040
Citywide Rezoning	2600
Initial Land Use Plan	2270
Auto Trip Reduction (Preferred Scenario)	1840

The number of daily auto trips generated by new development under the Auto Trip Reduction scenario is approximately 16,690.

2. Critical Movement Analysis

Critical Movement Analysis was used to estimate how the 39 major intersections in the study area would perform under the four build-out scenarios. Critical movement volumes were estimated for the PM peak hour. The critical movement volume at an intersection is the sum of all conflicting traffic movements expressed in vehicles per hour (see Appendix E for an illustration of “conflicting movements”). Intersections with 1,500 or fewer critical movements per hour are considered to operate adequately, i.e. motorists will, on average, wait no more than two light cycles to get through the intersection. Once this threshold is exceeded, intersection operation starts to deteriorate significantly.

Intersection performance for the 4 scenarios was compared, looking at both the number of intersections at which the PM critical movement threshold is exceeded and the sum of critical movements above the threshold.

Currently, the critical movement threshold in the PM peak hour is exceeded at one intersection (Monsignor O’Brien Hwy/Land Blvd). It is estimated that in 20 years traffic from existing development, projects that have received permits prior to July 2001 and due to build out shortly, and traffic increases

from development outside Eastern Cambridge will result in five intersections within the study area exceeding the critical movement threshold.

Under the Status Quo (existing zoning) scenario, which envisions development based on existing zoning, 10 of 39 intersections are expected to exceed the critical movement threshold while the threshold would be exceeded at 9 intersections under the other three scenarios.

There is a significant difference between the land use scenarios in terms of the sum of critical movements above the threshold resulting from new development as illustrated in the table below. The Auto Trip Reduction or Preferred scenario represents a two-thirds reduction in traffic impacts compared with the Status Quo (existing zoning) scenario.

SUMMATION OF CRITICAL MOVEMENTS ABOVE THRESHOLD	
SCENARIO	SUMMATION OF CRITICAL MOVEMENTS ABOVE THRESHOLD
Staus Quo (existing zoning)	2530
Citywide Rezoning	1650
Initial Land Use Plan	1290
Auto Trip Reduction (Preferred Scenario)	920

TRUCKS

The existing truck route through the study area is along Monsignor O’Brien Highway, a small segment of Cambridge Street, First Street, Binney Street, and Main Street. The analysis indicates that the highest truck volumes in the study area are on Monsignor O’Brien Highway, Cambridge Street, Main Street, Land Boulevard, and Binney Street.

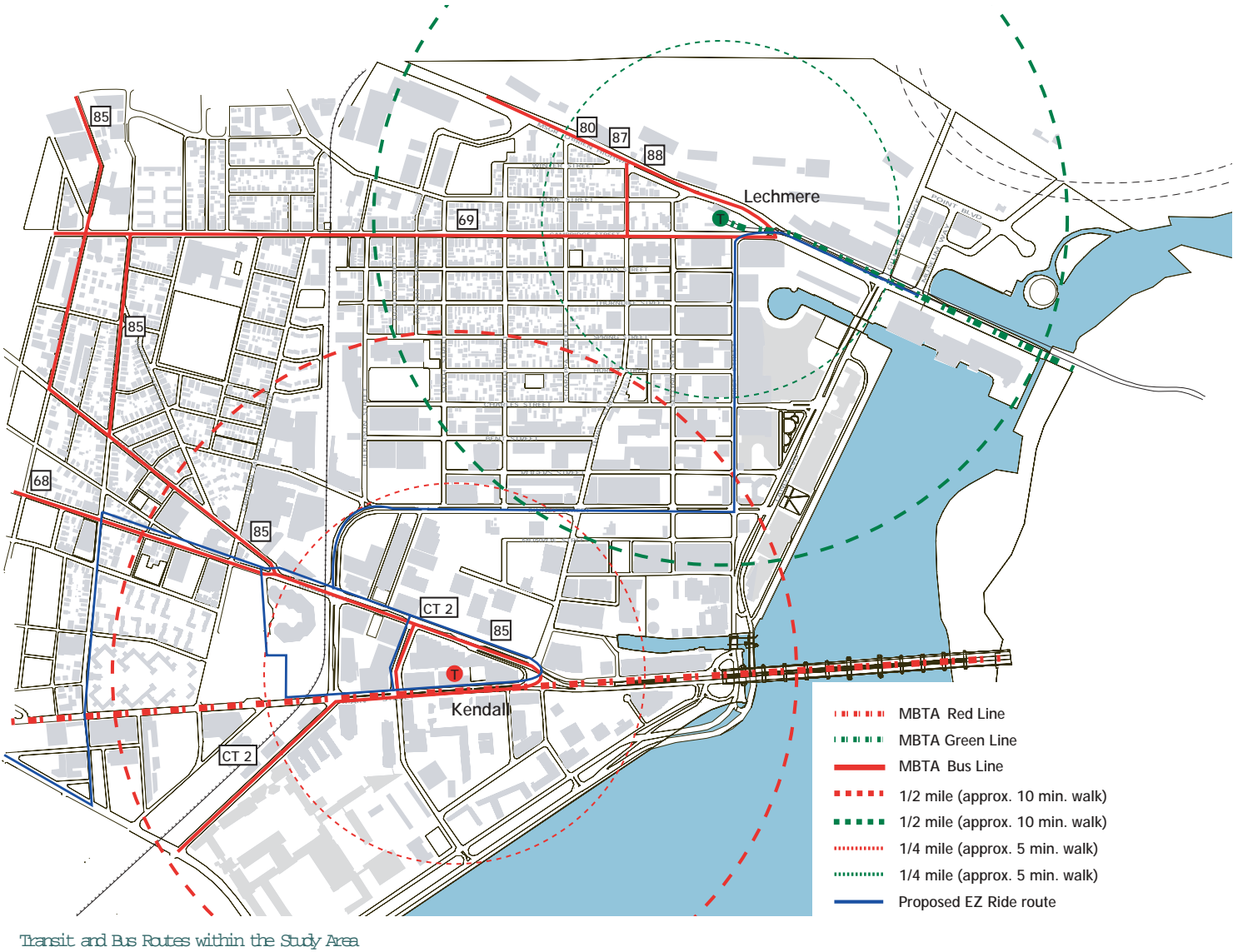
Other streets notably Third Street, Gore Street, Cardinal Medeiros, Warren Street, and Fulkerson Street, some of them with 24-hour truck restrictions, also have significant truck

traffic. It is important to remember that truck restrictions apply only to through trucks and not those making deliveries on the streets in question. Further, the data also shows that some of these streets are used by trucks at night. For example, according to 1998 and 2000 City of Cambridge data, Gore Street and Fulkerson Street had 66 trucks and 42 trucks, respectively, between 11 p.m. and 7 a.m. The high volumes of trucks on these streets affect the residential neighborhoods.

A recent state-funded regional truck study addresses truck issues in metropolitan Boston. The study sought to identify ways to reduce the impacts of truck noise and vibrations on residents, especially at night; ensure the continued delivery of goods and services by maintaining truck access to businesses and residences; and ensure, where feasible, that truck traffic is directed towards appropriate roadways. Key routing recommendations of the truck study are incorporated in the transportation recommendations of this report (see Appendix F).

PUBLIC TRANSPORTATION

While the Massachusetts Bay Transportation Authority (MBTA) Red Line offers excellent connections to downtown Boston and further into Cambridge and Somerville, the Green Line only provides connections to downtown Boston because it terminates at Lechmere. The Red Line serving the Kendall station operates at headways of 4 minutes during the rush hours and 6 minutes at other times of the day. The Green Line operates at a 3.5 minute frequency during the rush hours and 5 minutes at other times of the day.



MBTA rapid transit and bus service in the study area are presented on the diagram “Transit and Bus Routes within the Study Area”. Four bus routes (#69, 80, 87 and 88) terminate at Lechmere and four routes (#64, 68, 85 and CT2) connect to or terminate at Kendall station. The study area is also served by The Wave, a public shuttle running between the CambridgeSide Galleria and Kendall Square and primarily employee shuttle services operated by the Charles River Transportation Management Association.

According to the 1990 US Census, transit as a mode of travel to work for commuters living in the study area varied from 16.9% in the Wellington-Harrington neighborhood to 22.7% in the North Point area. The transit share for commuters working in the study area varied from 3.3% near the Twin City Mall to 24.2% in the Lechmere area. According to recent data the transit share of commuters to the heart of Kendall Square is 52%. The 2000 US Census update of the Cambridge Journey to Work data is expected to be available in 2003.

MBTA service and ridership data for trains and buses confirms the importance of the Red line and suggests that the bus system has sufficient capacity to meet current demand, with the exception of the #85 route from Spring Hill via Union Square, and #87 from Arlington Center via Elm Street. Looking at boardings by stop illustrates a much higher dependence on bus rather than rail at Lechmere station compared to Kendall station.

The diagram “Transit and Bus Routes within the Study Area” shows a quarter-mile and half-mile radius, a reasonable walking distance, around the Kendall and Lechmere stations. All of East Cambridge is within half a mile of Lechmere station. Most of Area IV and Kendall Square is within half a mile of Kendall Station. However, much of Wellington- Harrington is further than half a mile from either of the two stations.

North Station, which provides regional service to the north and north-east, is slightly more than a mile away from the center of the Eastern Cambridge residential neighborhoods and is linked to Lechmere by the Green line. The EZRide, a shuttle connecting North Station to additional locations in Eastern Cambridge and Kendall station under planning jointly by the City and the Charles River Transportation Management Association (CRTMA) with an anticipated start in Winter 2001/02.

Although Main Street has ample space to accommodate buses and shuttles close to Kendall station, operations are somewhat restricted at the eastern end by limited access and bus circulation space. The curbside use allocations on Main Street are being revamped to better accommodate buses.

The connection with Broadway is from eastbound Broadway only, and there is no direct connection with Third Street. While this circulation works well for bus routes from the west (MBTA #64, #68, #85) terminating at Kendall, other buses have to go around the block.

The Kendall Square area attracts employees from beyond the I-95 corridor. While there are many express commuter buses serving downtown Boston and Kenmore Square, there are none to Kendall.

Other transit issues include the lack of direct connections between Eastern Cambridge and most nearby communities – Brookline, Chelsea, Everett, Melrose, Somerville, and even parts of Boston, including Logan Airport. A trip to any of these cities often requires going into Boston and transferring to another line. For example, counting the MassPort bus, a trip to Logan Airport from Kendall Square requires three transfers. Crowding on the transit lines in the downtown area further exacerbates the problem.

Three proposed transit improvements will especially affect the study area. These are the Urban Ring, Green Line extension, and the EZ Ride North Station shuttle. The Urban Ring and the Green Line extension are major MBTA projects for which funding has not yet been identified.

(i) Urban Ring

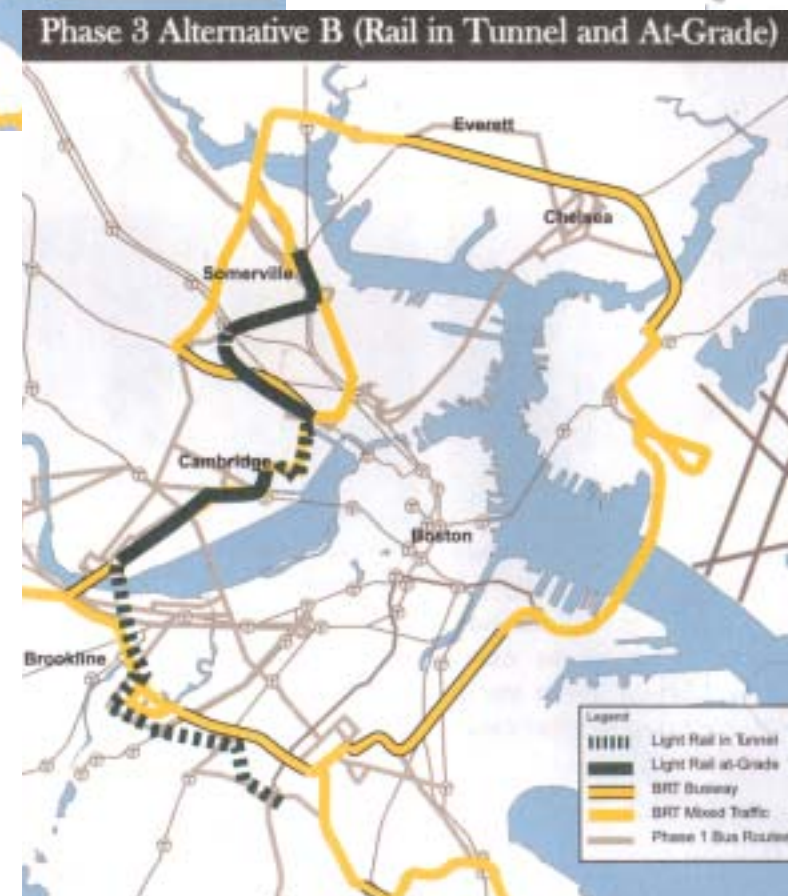
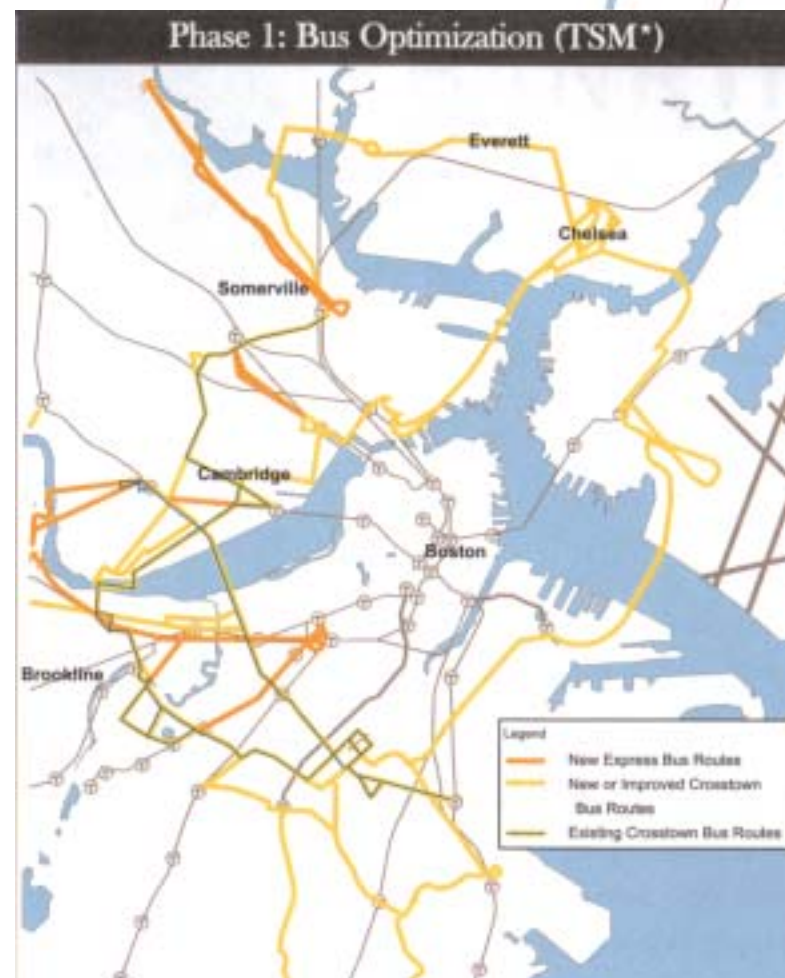
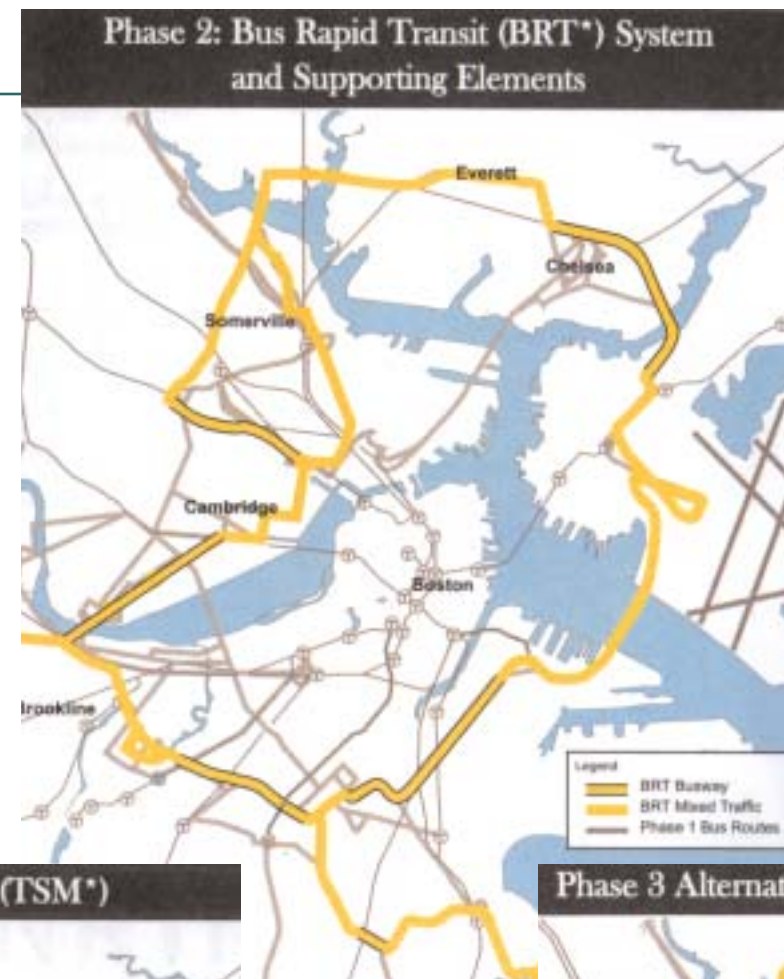
The Urban Ring is proposed as a circumferential transit line that would encircle downtown Boston, connecting the “spokes” of the existing radial transit network in Cambridge, Somerville, Chelsea, Everett, Brookline, and Boston. It would greatly reduce the need for transfers, cutting travel time, and increasing travel options for commuters. The Ring will greatly enhance T service in Cambridge in general and Eastern Cambridge, in particular. It is proposed to be implemented in three phases – transportation system management (TSM), bus rapid transit system (BRT), and light rail in tunnel (LRT).

(ii) Green Line Extension

The MBTA plans to extend the Green Line beyond Lechmere to Tufts University / West Medford via Somerville. This will require relocating the Lechmere Station across Msgr. O’Brien Highway to North Point.

(iii) EZ Ride North Station Shuttle

A shuttle connecting Eastern Cambridge to North Station in Boston is presently being planned jointly by the City and the Charles River Transportation Management Association (CRTMA). This project has funding and is expected to begin in Winter 2001/02.



MBTA Urban Ring Plans
Courtesy of the Massachusetts Bay Transportation Authority



Pedestrian & Bicycle Count Locations

PEDESTRIAN ENVIRONMENT

The study area's residential neighborhoods, with narrow streets, low traffic volumes, and small blocks are eminently walkable and bikeable. Furthermore, the transit stations, which are within a half mile from most of the study area, and a high level of existing and permitted entertainment and retail activity within the study area, encourage walking.

Elsewhere, especially near Kendall Square, the blocks are longer and the roads and intersections wider making walking and bicycling less attractive. However, most new development in the Kendall Square area, Tech Square and Cambridge Research Park, for example, is being required to provide pedestrian amenities and break up existing "superblock" sites.

While the Kendall station is easily accessible by pedestrians Lechmere is surrounded by major streets that are difficult to cross.

Pedestrian data is presented graphically in Appendix H for weekday peak hour conditions, AM and PM. As expected, the highest volumes are near the transit stations and where there are concentrations of commercial development. Four of these intersections had more than 500 pedestrians crossing in at least one peak hour.

Most streets in the study area have marked crosswalks and reasonably wide sidewalks. However, Binney Street, which is perceived as unsafe to cross by many residents, presents a barrier

between the Kendall Square area and nearby residential neighborhoods. The limited crossing locations along the length of Binney Street, the high speeds, high volume of traffic, and multi-lane configuration of the street make crossing the street difficult. The City, through the special permit mitigation process, is requiring pedestrian improvements at the intersections of Binney and Fulkerson, Sixth, Third, and Second streets.

Pedestrian safety improvements along Binney, Broadway, and Cambridge Street could include providing neckdowns at intersections, tighter turning radii to slow vehicles, and shorter and protected crosswalks.

Some streets at the edges of the study area also create barriers to pedestrians. Pedestrian access to the river is impeded by Land Boulevard and Memorial Drive. The Grand Junction rail corridor presents an opportunity for north-south pedestrian and bike connection, but limits access between Wellington-Harrington and East Cambridge and the river.

At Lechmere, Monsignor O'Brien Highway is seven lanes wide and carries more than 25,000 vehicles a day and pedestrians currently experience long crossing delays. Improved crossing of the highway will be increasingly important as the North Point area develops, the North Point Park is completed, and the Green Line station is relocated.

BICYCLE ENVIRONMENT

Bicycling is an important mode of transportation in Eastern Cambridge for commuters and residents alike. Currently, there are bicycle facilities along Broadway to the west of Mid-block Connector, and along the Western and Mid-block Connectors.

Bicycle data from intersection counts, presented in Plan G, shows that, as expected, summer volumes are two or three times higher than winter volumes. The analysis identifies four locations where there are over 100 bicycle movements during at least one peak hour in summer: Cardinal Medeiros/Hampshire, Broadway/Hampshire, Harvard /Portland, and Portland /Broadway.

Since most local streets in the study area have low traffic volumes (fewer than 5,000 vpd) and average speeds less than 25mph (Windsor Street at 29 mph is an exception), they do not warrant separate bicycle facilities. The City does have an ongoing traffic calming program to reduce speed and increase safety on streets that are susceptible to speeding or are near schools and playgrounds.

MIT, Kendall Square, and downtown Boston are major destinations for bicyclists in Eastern Cambridge. Currently, many of the major streets and arterials in the vicinity of MIT and Kendall Square do not have bike facilities and many of the intersections in the Kendall Square area are not very bike-friendly. More than 40% of the vehicles entering the intersections of Broadway/Galileo Way or Main Street/Galileo Way are turning vehicles. The City is working to address the problem of wide turning radii at this intersection, which currently means that turning vehicles do not have to reduce speed, making it unsafe for bicyclists going straight through the intersections. In addition, though Boston is a short ride away, the bicycling facilities along the Longfellow Bridge or the Monsignor O'Brien Highway are very poor. As with pedestrians, desired bicycle connections to the river and to North Point Park meet major barriers, either busy streets or the railroad.

OPPORTUNITIES

Major opportunities to improve transportation in Eastern Cambridge that should guide future planning efforts are listed below. Many of the proposed measures will improve conditions for pedestrians and bicyclists. A number of these are being addressed in already committed development mitigation requirements. Appendix F, the complete list of recommended transportation improvements discussed during the ECaPS process notes where this is the case. The remainder will have to be prioritized and implemented through future mitigation requirements or as other funding becomes available.

- The relocation of Lechmere station presents an opportunity to extend First Street to connect directly with Monsignor O'Brien Highway, which would encourage the use of First Street. This will be especially important as development occurs in North Point.
- Measures to ensure safe at-grade pedestrian and bicycle crossings of Memorial Drive and Msgr. O'Brien Highway.
- Improved transit access to the North Point area by the proposed Green Line extension and the proposed Urban Ring would ease congestion on Monsignor O'Brien Highway and greatly enhance non-auto access to and from the study area. While planning is in progress, funding has not yet been secured for these projects.
- Pedestrian and bus links from North Point to the Bunker Hill Community College Station would provide access to the Orange Line from the study area.
- In addition to Lechmere, a number of the new MBTA bus routes proposed in Phase I of the Urban Ring would serve Kendall station. Several of these routes would benefit from a link to Third Street at Broadway/Main streets.
- Truck traffic related improvements would help keep through truck traffic off residential streets.
- Off-road, multi use paths could provide a significant transportation and recreation resource for the study area. Opportunities for such paths lie along the Grand Junction

railroad right-of-way and at North Point, connecting the proposed Somerville regional bike path to the river. The City has committed funds for a feasibility study of the Grand Junction path in the fiscal year 2001-02.

- City policy requires consideration of bike facilities on all streets as they are reconstructed and restriped.